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APPENDIX G		
SAN LUIS REY MUNICIPAL WATER DISTRICT WARNER		
PROPERTY SUPPLEMENTAL ANALYSIS TECHNICAL		
MEMORANDUM No. 8; PROJECT DESCRIPTION FOR SAN		
Luis Rey Municipal Water District Master Plan		
FOR WATER AND WASTEWATER SERVICES		



February 2, 2006

To: Interested Agencies and Individuals

From: San Luis Rey Municipal Water District

Subject: Notice of Preparation of a Draft Program Environmental Impact Report for the

San Luis Rey Municipal Water District Water and Wastewater Master Plan

The San Luis Rey Municipal Water District (SLRMWD), as Lead Agency, will prepare a Program Environmental Impact Report (EIR) for the project identified below. SLRMWD needs to know the view of your agency regarding the scope and content of the environmental information that is pertinent to your agency's statutory responsibilities in connection with the proposed project. Your agency will need to use the EIR prepared by our agency when considering your permit or other approvals for the project.

The project description, location, and probable environmental effects of the proposed project are included in the attached material. An initial study has not been prepared for the project.

A public scoping meeting will be held during the San Luis Rey Municipal Water District Board Meeting scheduled for February 15, 2006, at 4:00 p.m. at the Pala Convention Center Meeting Rooms, 11154 Highway 76, Pala, CA 92059. Public input via oral or written communication will be taken at this meeting. In addition, public input can be sent via mail or email to:

Ms. Carol Hamel, Deputy Board Secretary San Luis Rey MWD c/o Law Offices of Susan M. Trager 19712 MacArthur Blvd., Suite 120 Irvine, CA 92612

Email: slrmwd@tragerlaw.com

Due to the time limits mandated by State Law, your response must be sent at the earliest possible date, but not later than 30 days after the date of this notice.

Please include the name of a contact person in your agency, if appropriate. Responsible agencies are requested to indicate their statutory responsibilities in connection with the project when responding.

Attached: Project Description

PROJECT DESCRIPTION FOR THE SAN LUIS REY MUNICIPAL WATER DISTRICT MASTER PLAN FOR WATER AND WASTEWATER SERVICES

Project Location

The San Luis Rey Municipal Water District (SLRMWD) is located in the northern portion of San Diego County, along State Route 76, just east of Interstate 15 (Figure 1). The existing SLRMWD service area encompasses approximately 3,000 acres in unincorporated San Diego County. Existing land uses are largely agricultural. Nearby residential communities include Rainbow to the north, Fallbrook to the northwest, Bonsall to the west and Pala to the east. Rainbow Municipal Water District, to the north, and Valley Center Municipal Water District, to the south, are the two public water service providers whose infrastructure runs closest to SLRMWD. The Yuima Water District is located approximately four miles to the east.

Project Background

Since its formation in 1957, SLRMWD has taken an active role in protecting the volume and quality of local groundwater resources. To date, SLRMWD has not used its powers to supply water or wastewater services as most of SLRMWD's service area is in agricultural production. However, several developments are proposed in SLRMWD's service area for the near future and the developers have approached SLRMWD about obtaining water and wastewater services. Figure 2 illustrates the various landholdings that are proposed for development with a combination of residential, recreational, educational, and commercial/professional uses. Over the past several months, SLRMWD has proceeded with evaluation of the viability of providing retail water and wastewater service to an urbanizing district. In order to provide these services, SLRMWD must obtain from the San Diego Local Agency Formation Commission (LAFCO) the authority to activate its latent powers to provide water, wastewater, and recycled water services and SLRMWD must become a member of the San Diego County Water Authority.

With potential growth now imminent, SLRMWD has prepared a Districtwide Master Plan for Water and Wastewater Services (Master Plan) to serve as a conceptual road map for providing future water and wastewater service. The program environmental impact report (EIR) for which this Notice of Preparation is being circulated will analyze the environmental impacts of the approval by SLRMWD of its Master Plan in accordance with the California Environmental Quality Act, Public Resources Code § 21000 (CEQA) and its implementing guidelines, California Code of Regulations, Title 14, § 15000 (CEQA Guidelines).

Project Components

The Master Plan outlines a conceptual plan for providing domestic water supply, wastewater service, and recycled water service to potentially developable areas within SLRMWD (and certain areas outside district boundaries) to ensure adequate service is maintained through the ultimate build-out condition (2030). The proposed water and wastewater projects are divided into two phases, based on anticipated development. Phase I includes the Meadowood, Campus Park West, Campus Park, Gregory Canyon Landfill, and Warner Property projects (Figure 2).

All other developments, including the addition of the existing Lake Rancho Viejo development, are not anticipated to occur until Phase II. The recycled water system may also be constructed in two phases, although phasing is highly dependent on projected demand for recycled water.

The components of the proposed Master Plan systems are summarized in Table 1. The proposed components of the water system are shown in Figure 3 and include infrastructure for imported potable water, including two possible connections to Metropolitan Water District (MWD) aqueducts, and groundwater extraction/treatment facilities. The east-west pipeline from MWD aqueduct connection No. 1, traversing the Warner Property to Pala Temecula Road, is proposed by Yuima Water District. SLRMWD would utilize approximately 10 percent of the pipeline capacity. Accordingly, the EIR will evaluate a possible alignment of the pipeline, but the Yuima Water District will act as lead agency in the CEQA analysis for the ultimate alignment.

Table 1
Proposed Project Components

	Qua	ntity	
Component	Phase I	Phase II	
Imported Potable Water System			
Potable Water Pipelines (varies 8 to 27 inches in width)) 19.3 miles 13.2 miles		
Potable Reservoirs	Two 6.6 MG	Two 7.6 MG	
	One 2.6 MG		
Pressure Reducing Stations	12,300 gpm	3,500 gpm	
-	3,700 gpm	2,500 gpm	
	4,000 gpm	4,000 gpm	
Turnout Supply Connection	13.2 MGD	13.2 MGD	
Groundwater System (timing unknown)			
8-inch Pipeline (Groundwater System and Brine	13.8	miles	
Disposal)	(Timing	unknown)	
Extraction Wells	4 v	vells	
	(Timing	unknown)	
Groundwater Pump Station	260	gpm	
	(Timing	unknown)	
Reverse Osmosis Groundwater Treatment Plant	2-4	MGD	
	(Timing	unknown)	
Wastewater System			
Gravity Mains (varies 8 to 24 inches in width)	3.8 miles	1.9 miles	
Lift Station	1.8 MGD	0.5 MGD	
Force Mains	<0.1 mile 0.8 mile		
Wastewater Treatment Plant	2.4-4.2 MGD –		
Recycled Water System			
Recycled Water Pipeline	9.4 miles	15.8 miles	
Recycled Water Pump Station	3,000 gpm	7,300 gpm	
		(Expansion only)	

gpm= gallons per minute MG= million gallons

MGD= million gallons per day

The proposed wastewater system is shown in Figure 4 and the potential recycled water system is illustrated in Figure 5. The Phase II elements of the recycled system are extremely conceptual

based on speculative customers. Preliminary planning for this potential phase assumes construction only within existing disturbed right-of-way (State Route 76, Gird Road, West Lilac Road, and Old Highway 395).

Land to be served by elements in the Master Plan includes land not currently within the boundaries of SLRMWD. Accordingly, the primary study area to be analyzed in the EIR (approximately 5,420 acres) is larger than the existing service area boundaries of SLRMWD. The recycled water study area includes additional narrow widths extending on key roadways from the primary study area. A service area boundary adjustment by LAFCO would be required for SLRMWD to provide water, recycled water, and/or wastewater services to those lands.

Use of the Program EIR

The Master Plan will be evaluated per CEQA at a program level within the EIR. A program EIR (as defined at CEQA Guidelines §15168), can be used as the basic, general environmental assessment for an overall program that will be implemented through a series of related actions. The EIR must include all content requirements normally included in a project level EIR, although the level of detail will be more general in nature in the EIR, as compared to later Project EIRs. An EIR may be used as a tiering document to facilitate preparation of future environmental evaluations for individual projects that were not, at the time of EIR preparation, described in sufficient detail. Environmental documentation for some of these future projects may require preparation of EIRs, while others, depending on the level of potential impact, may be satisfied with preparation of a Negative Declaration or a Mitigated Negative Declaration. Preparation of an Initial Study for each specific future project will provide guidance as to the level of potential impact and the appropriate level of environmental analysis to evaluate the impact of that project.

Probable Effects/Issues to Be Addressed in the EIR

The probable environmental impacts of the project will be those expected to be associated with a water agency meeting the demand of a community in the process of converting from primarily agricultural land uses to a more urban mix of residential and commercial land uses. This EIR will address how implementation of the proposed Master Plan would result in environmental effects for the following issue areas:

- Aesthetics
- Agricultural Resources
- Air Quality
- Biological Resources
- Cultural Resources
- Geology/Soils
- Hydrology/Water Quality
- Land Use and Planning

- Noise
- Recreation
- Transportation/Circulation
- Public Services/Utilities/Energy
- Paleontological Resources
- Significant Irreversible Environmental Changes
- Growth-Inducing Impacts
- Cumulative Impacts

These issue areas were selected because they were determined to have the potential for significant environmental effects.

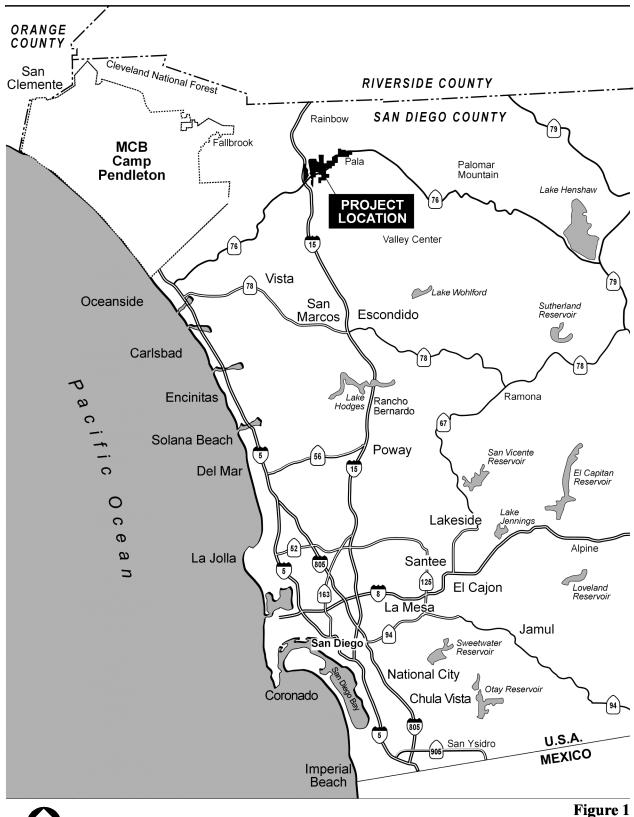
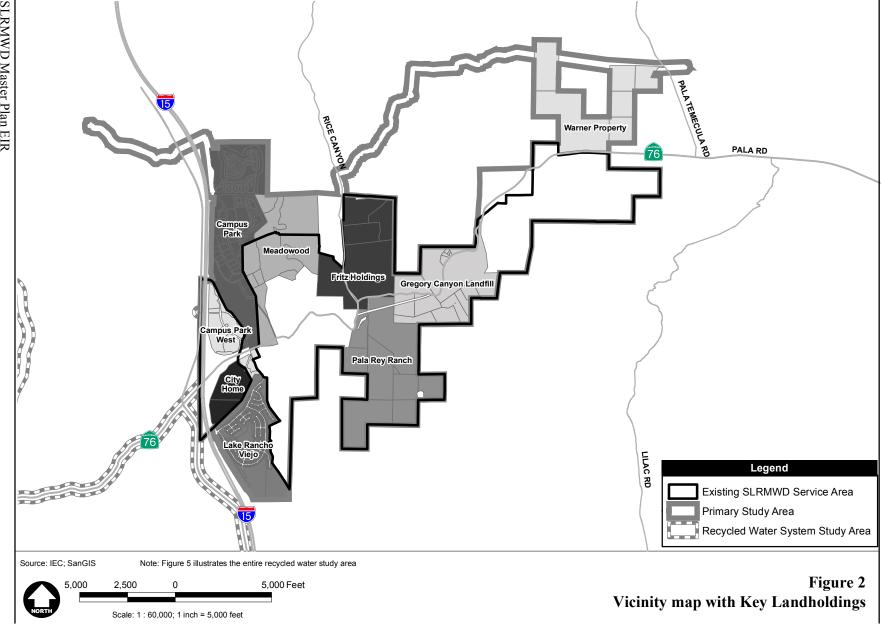
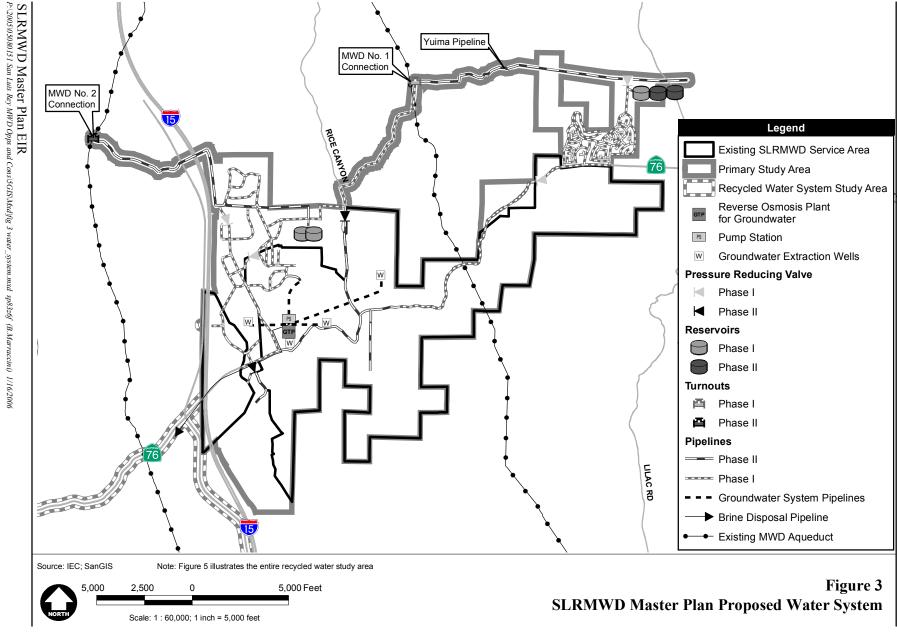
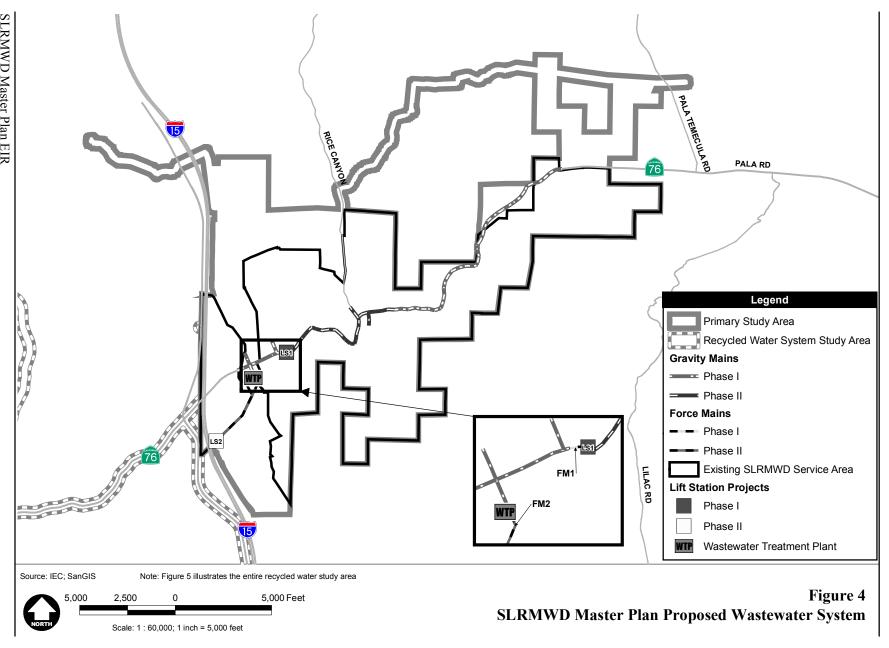


Figure 1 Regional Location Map









SAN LUIS REY MUNICIPAL WATER DISTRICT MASTER PLAN FOR WATER AND WASTEWATER SERVICES

TECHNICAL MEMORANDUM No. 8

Date:

January 9, 2006–1st **DRAFT**

February 6, 2006 – **FINAL DRAFT**

Subject:

WARNER PROPERTY SUPPLEMENTAL ANALYSIS

Prepared By: Reviewed By: Scott Humphrey, P.E. Preston Lewis, P.E.

EXECUTIVE SUMMARY

Infrastructure Engineering Corporation (IEC) recently completed a Master Plan for Water and Wastewater Services (Master Plan) for the San Luis Rey Municipal Water District (SLR). Since the completion of the final report, a new development, referred to as the Warner Property, has expressed interest in obtaining water and wastewater service from SLR. This development is currently outside of SLR's service area boundary and was not included in the original Master Plan study area. Accordingly, the Warner Property was not accounted for when developing recommended facilities for the Capital Improvement Program (CIP).

In an effort to quantify the water demands and wastewater flows from the Warner Property in order to develop a plan for providing water and wastewater service, SLR requested that IEC perform this analysis as a supplement to the Master Plan. The results of this analysis were used to define the facilities necessary to provide water, wastewater and recycled water service to the Warner Property and determine the impacts to the CIP established in the Master Plan. The result is a revised CIP that includes the facilities necessary for SLR to provide water, wastewater and recycled water service to the revised study area, which includes the Warner Property.

This technical memorandum addresses the following:

- Study area
- Water demand and wastewater flow projections
- Storage requirements
- Wastewater treatment alternatives
- Water distribution system impacts
- Recycled water system analysis
- Capital Improvement Program (CIP)



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The demand/flow projections, storage requirements, wastewater treatment alternatives, and recycled water system analysis include revisions based upon the addition of the Warner Property. The Capital Improvement Program is a revised set of improvements and cost estimates that is intended to replace the CIP developed as part of the Master Plan.

INTRODUCTION

In accordance with our engineering services agreement dated December 28, 2005, IEC has performed the Warner Property Supplemental Analysis and developed a revised Capital Improvement Program (CIP) that will replaced the CIP presented in the Master Plan, dated November 2005.

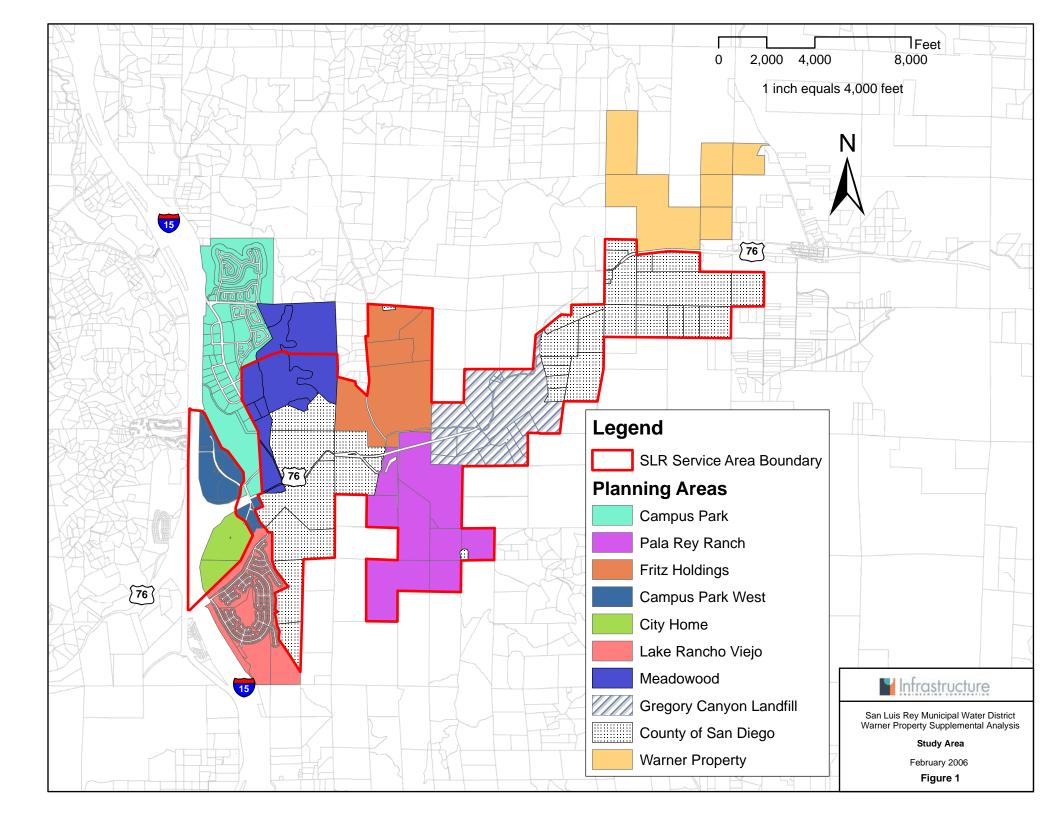
STUDY AREA

The Warner Property area consists of approximately 430 acres and is located on Highway 76 near the intersection of Pala Temecula Road. The preliminary land use plan has established a mixture of residential land use densities for the development. The location of the Warner Property is shown on Figure 1 along with the planning areas analyzed as part of the Master Plan.

WATER DEMAND PROJECTIONS/WASTEWATER FLOW PROJECTIONS

A preliminary land use plan for the Warner Property was received from Shapouri & Associates on December 28, 2005. This plan designates approximately 1,000 residential units, which consist of a mixture of single-family residential and condominium use types. The land use plan also contains approximately 1 acre of parks, 4 acres of equestrian use, and 273 acres of non-irrigated open space.

Using the recommended water and wastewater duty factors defined in the Master Plan, water demand and wastewater flow projections were developed for the Warner Property. These projections are presented in Table 1.





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Table 1 - Water Demand/Wastewater Flow Projections for the Warner Property Project

Land Use Description	Quantity	Water EDUs	Wastewater EDUs	Water Use (gpd)	Wastewater Use (gpd)
Residential - 6,000 Sq. Ft. Lots	133 units	133	133	66,500	33,250
Residential - 5,000 Sq. Ft. Lots	151 units	151	151	75,500	37,750
Residential - 4,000 Sq. Ft. Lots	208 units	208	208	104,000	52,000
Residential - 3,000 Sq. Ft. Lots	190 units	190	190	95,000	47,500
Condominiums	318 units	239	318	119,500	79,500
Parks	1 acre	8	1	4,000	250
Non-Irrigated Open Space	273 acres	0	0	0	0
Equestrian*	3.7 acres	4	0	2,000	0
Totals		933	1,001	466,500	250,250

^{*}Equestrian Use was assigned a water duty factor of .5 EDU/acre to account for water use for horses and dust control.

It should be noted that the Master Plan did not contain a duty factor for equestrian use. Equestrian use has been assigned a water duty factor of .5 EDU/acre to account for water use for horses and dust control. A summary of the water and wastewater flow projections for the entire Study Area, including the projections from the Warner Property is presented in Table 2.

Table 2 - Water Demand/Wastewater Flow Projections for the SLR Study Area

Area	Water EDUs	Wastewater EDUs	Water Use (gpd)	Wastewater Use (gpd)
Meadowood	1,785.0	1,165.0	892,500	291,250
Campus Park West	844.0	879.0	422,000	219,750
Campus Park	2,148.0	2,193.8	1,074,000	548,450
County of San Diego	909.7	240.9	454,850	60,213
Gregory Canyon Landfill	142.0	0.0	71,000	0
City Home	846.0	881.0	423,000	220,250
Lake Rancho Viejo	1,444.0	764.0	722,000	191,000
Fritz Properties*	1,628.0	905.0	814,000	226,250
Pala Rey Ranch (McCarthy)*	1,320.0	1,400.0	660,000	350,000
Warner Property	931.0	1,001.0	465,500	250,250
Totals	11,997.7	9,429.7	5,998,850	2,357,410



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STORAGE REQUIREMENTS

The Master Plan recommended the following storage criteria:

• Operational Storage (200 percent of average day demand) + Fire Flow Storage (0.8 mg Total) + in-District Emergency Storage (300 percent of average day demand) = 500 percent of average day demand plus 0.8 mg

Three pressure zones were established in the Master Plan, based upon the elevation required to maintain the established pressure design criteria. With the addition of the Warner Property, a fourth pressure zone will be necessary in the eastern portion of the SLR service area. This pressure zone (Zone 4) will have to be at the same hydraulic grade line (HGL) as Zone 1, however these zones will not be linked as it would require a pump station or a dedicated pipeline to transfer water from Zone 1 to Zone 4 or vice versa. Water from Zone 4, however, will be able to supplement water into Zone 2 and Zone 3, once the transmission main within Highway 76 is completed. The revised pressure zones are shown in Figure 2.

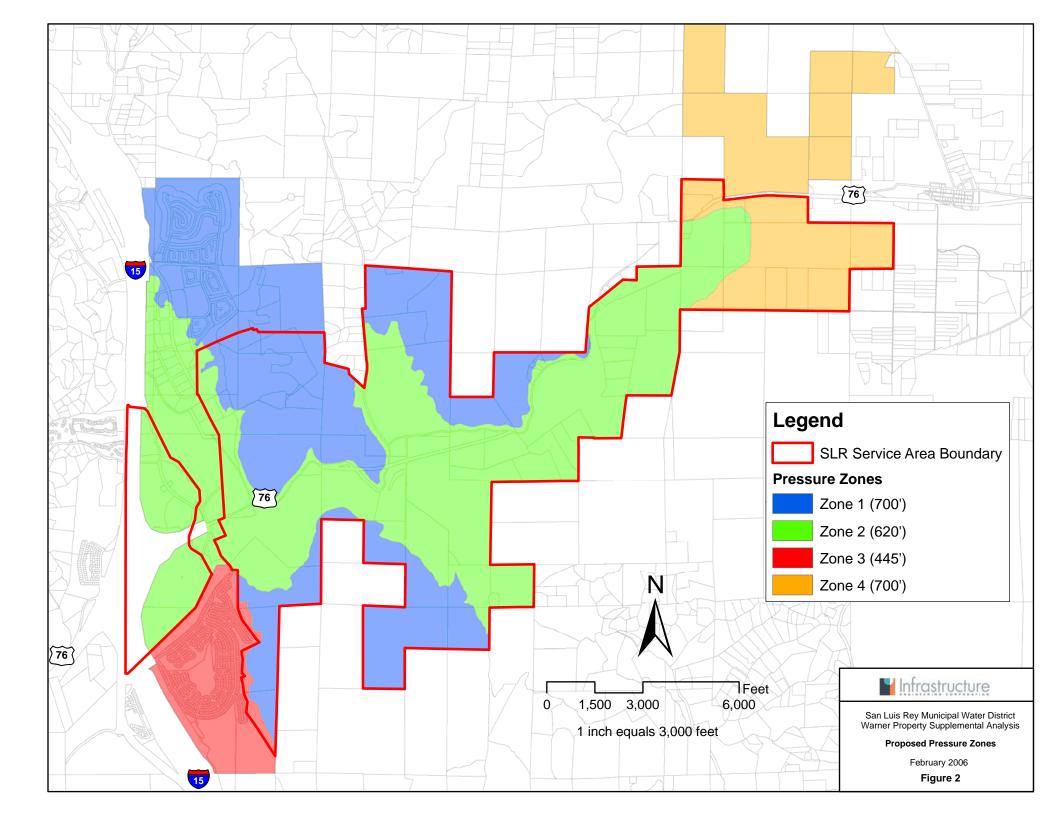
Based upon the storage criteria recommended in the Master Plan, storage requirements for each pressure zone have been calculated. Consistent with the Master Plan, storage requirements have been separated into near-term and ultimate phases. The near-term storage includes the Meadowood, Campus Park, Campus Park West, Gregory Canyon Landfill and Warner Property planning areas. The revised storage requirements are presented in Table 2, attached to the end of this Technical Memorandum.

From Table 2, it can be seen that an additional 2.6 MG of near-term storage will be required due to the additional Warner Property water demand.

The Master Plan recommended Phase I and Phase II storage based upon the near-term and ultimate storage requirements. Each phase consisted of two reservoirs with Phase I consisting of two 6.6 MG reservoirs and Phase II consisting of two 7.7 MG reservoirs. Due to environmental constraints, both reservoir sites were located within the Meadowood planning area. With the addition of the Warner Property, the opportunity to move the Phase II storage to a site other than that containing the Phase I storage now exists. From a reliability and redundancy standpoint, this is a preferred alternative.

Initial storage alternatives examined as part of this analysis included combining the Phase I storage and dividing it amongst the two sites, however, without the ability to transfer water along Highway 76; this could create water quality issues at the Warner Property site. Therefore, it was determined that the preferred alternative is to construct the near-term storage required for the Warner Property at the Warner Property site and move the Phase II storage to the Warner Property Site. The construction of the Phase II storage would coincide with the construction of a transmission main in Highway 76 connecting Zone 4 to Zone 2, allowing storage from the Warner Property site to supplement Zone 2 and Zone 3.

The proposed storage phasing is presented in Table 3.



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Table 3 - Proposed Storage Phasing

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Reservoir	Proposed Capacity (MG)	Phase	Location		
R1-A	6.6	I	Meadowood		
R1-B	6.6	I	Meadowood		
R2	2.6	I	Warner Property		
R3-A	7.6	II	Warner Property		
R3-B	7.6	II	Warner Property		
Total Phase I	15.8	N/A	N/A		
Total Phase II	15.2	N/A	N/A		
Grand Total	31.0	N/A	N/A		

In addition to the change in storage requirements due to the addition of the Warner Property, the turnout connection sizing also increases slightly. The Master Plan sized the turnouts at 18.9 cfs, which corresponds to the ultimate peak week demand of the study area. With the addition of the Warner Property, the ultimate peak week demand increases to 20.3 cfs. Therefore it is recommended that each MWD turnout be sized at a capacity of 20.3 cfs. The revised supply requirements for turnout connections are presented in Table 4.

Table 4 - Supply Requirements for Turnout Connections

Connection	Ultimate Average Day Demand (mgd)	Ultimate Average Day Demand (cfs)	Ultimate Max Week Demand (mgd)	Ultimate Max Week Demand (cfs)
Connection No. 1 - East	6.6	10.2	13.1	20.3
Connection No. 2 - West	6.6	10.2	13.1	20.3

WASTEWATER TREATMENT ALTERNATIVES

Wastewater treatment alternatives with the addition of the Warner Property remain primarily the same as the Master Plan, with the addition of a gravity main in Highway 76 to convey wastewater from the Warner Property to the Wastewater Treatment Plant (WWTP) location. The Master Plan analyzed three options for treating wastewater from the SLR service area:

- Option 1 Construction of a water reclamation facility to treat wastewater flows generated by SLR, located within the SLR service area
- Option 2 Discharging wastewater into the existing Rainbow Municipal Water District (RMWD) trunk sewer in SR-76, East of I-15, and conveying wastewater flow to the City of Oceanside's San Luis Rey Wastewater Treatment Plant (Oceanside WWTP) or a potential future reclamation facility at the Oceanside WWTP site.

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• Option 3 -Construction of a "regional" water reclamation facility to treat wastewater flows generated by SLR and RMWD, located within the SLR service area.

The change to Option 1 and Option 2 is the incremental impact to the proposed WWTP. The treatment capacity will need to be increased by 0.3 mgd to accommodate the Warner Property wastewater flows. The Option 1 WWTP will increase from 2.1 MGD to 2.4 MGD and the Option 2 WWTP will increase from 3.6 MGD to 3.9 MGD. For the purposes of this analysis, Option 2 will not change because information regarding the cost of the negotiation or purchase of actual capacity in the Oceanside WWTP, the land outfall, or the ocean outfall was unavailable.

The most significant change to the proposed wastewater system due to the addition of the Warner Property is that the conveyance facilities in Highway 76 from the Warner Property to the WWTP site now must be constructed during Phase I. These facilities were designated as Phase II facilities in the Master Plan.

WATER DISTRIBUTION SYSTEM IMPACTS

The Phase I and Phase II facilities in the Master Plan remain mostly unchanged due to the addition of the Warner Property. The two primary changes to the water CIP are as follows:

- As discussed in the Storage Requirements section, a 2.6 MG storage reservoir will be required in Phase I to serve the Warner Property. All of the Phase II storage was moved to the Warner Property site.
- A transmission pipeline in Highway 76 connecting the Warner Property to the rest of the distribution system has been designated as a Phase II facility.
- Two additional PRVs will be required; one from the Yuima Pipeline into the Warner Property (Phase I) and one in Highway 76 when the above referenced transmission main in constructed (Phase II).

RECYCLED WATER SYSTEM ANALYSIS

According to the preliminary land plan for the Warner Property, there is a very small amount of potential recycled water use for the development. The open space is unirrigated and the only potential recycled water use is for the proposed park (1 acre) and possibly the proposed equestrian center for dust control (3.7 acres). Using the recycled water use factors from the Master Plan, this equates to a total potential recycled water use of 18,800 gpd (average annual demand). Using the recycled water peak factors from the Master Plan, this equates to a peak recycled water demand of 65 gpm. The Warner Property is located approximately 4 miles from the proposed WWTP location. The distance from the WWTP combined with the relatively low potential recycled water demand makes the likelihood of actually serving the Warner Property Recycled water relatively low. However, consistent with the Master Plan methodology, the Warner Property will be added

San Luis Rey Municipal Water District Warner Property Supplemental Analysis Technical Memorandum No. 8 February 6, 2006 Page 9 of 32

to the Phase II potential recycled water users, should SLR wish to promote more widespread beneficial use of recycled water or should the need for additional recycled water in the Warner Property area arise. Potential recycled water demands, which include the Warner Property, are presented in Tables 5 and 6.

Table 5 - Potential Recycled Water Users

Source of Data	Potential User Name	Distance from WWTP (miles)	Acreage (acres)	Irrigation Use Factor (gpd/acre)	Potential Recycled Water Use (Average Annual Demand - GPD)
Meadowood	School	0.5	11	4,000	44,000
Meadowood	Parks	0.5	6	4,000	24,000
Meadowood	Landscaped Slopes	.25 - 2.0	33	4,000	132,000
Meadowood	Landscaped Parkways	.25 - 2.0	6	4,000	24,000
Meadowood	Groves	1	42	2,000	84,000
Campus Park West	Open Space/Landscape	0.25	22.7	2,000	45,400
Campus Park West	Parks	0.5	2.8	4,000	11,200
Campus Park	Parks	1.5	15	4,000	60,000
Lake Rancho Viejo	HOA Landscape	<.25	85	4,000	340,000
Gregory Canyon Landfill	Gregory Canyon Landfill	2	80	890	71,000
Table 5-2	Sycamore Ranch Golf Club	2.6	200	4,000	800,000
Table 5-2	Caltrans District 11	0.5	??	??	??
Table 5-2	Pala Mesa CC	3.3	164	4,000	656,000
Table 5-2	Fallbrook Country Club	4.7	108	4,000	432,000
Table 5-2	Live Oak Park	6	30	4,000	120,000
Table 5-2	Sullivan Middle School	4	10	4,000	40,000
Table 5-2	Bonsall Elementary School	6.2	10	4,000	40,000
Warner Property	Park/Equestrian Use	4	4.7	4,000	18,800
TOTAL			830.2		2,942,400



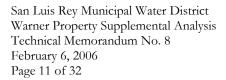
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Table 6 - Potential Peak Recycled Water Demands

	Table 6 - Potential Peak Recycled Water Demands						
No.	Source of Data	Potential User Name	Potential Recycled Water Use (Average Annual Demand - GPD)	AAD (GPM)	Peak Flow (GPM)	Max Day (MGD)	Average Annual Demand (AFY)
1	Meadowood	School	44,000	31	153	73,333	49
2	Meadowood	Parks	24,000	17	83	40,000	27
3	Meadowood	Landscaped Slopes	132,000	92	458	220,000	148
4	Meadowood	Landscaped Parkways	24,000	17	83	40,000	27
5	Meadowood	Groves	84,000	58	292	140,000	94
6	Campus Park West	Open Space/Landscape	45,400	32	158	75,667	51
7	Campus Park West	Parks	11,200	8	39	18,667	13
8	Campus Park	Parks	60,000	42	208	100,000	67
9	Lake Rancho Viejo	HOA Landscape	340,000	236	1,181	566,667	381
10	Gregory Canyon Landfill	Gregory Canyon Landfill	71,000	49	247	118,333	80
11	Table 5-2	Sycamore Ranch Golf Club	800,000	556	2,778	1,333,333	896
12	Table 5-2	Caltrans District 11	??	??	??	??	??
13	Table 5-2	Pala Mesa CC	656,000	456	2,278	1,093,333	735
14	Table 5-2	Fallbrook Country Club	432,000	300	1,500	720,000	484
15	Table 5-2	Live Oak Park	120,000	83	417	200,000	134
16	Table 5-2	Sullivan Middle School	40,000	28	139	66,667	45
17	Table 5-2	Bonsall Elementary School	40,000	28	139	66,667	45
18	Warner Property	Park/Equestrian Use	18,800	13	65	31,333	21
	TOTAL		2,942,400	2,043	10,217	4,904,000	3,297

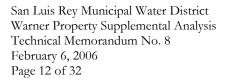
CAPITAL IMPROVEMENT PROGRAM (CIP)

The CIP presented in this section includes the water, wastewater, and recycled water system facilities necessary to provide service to the study area, including the Warner Property. This revised CIP is intended to replace the CIP presented in the Master Plan and therefore is presented herein in its entirety. Information from the previous sections has been incorporated into the development of the CIP. The CIP addresses the following topics:



• Unit Costs

- Potable Water Distribution System
 - Pipelines
 - o Reservoirs
 - o Pressure Reducing Stations
 - o Turnout Supply Connections
 - o Groundwater Treatment Facility Options
- Wastewater Collection and Treatment System
 - Gravity Mains
 - o Lift Stations
 - o Force Mains
 - o Wastewater Treatment Facility Options
- Recycled Water
 - Pipelines
 - o Pumps Stations
 - o Reservoirs
- Proposed System Improvements and Cost Estimates
 - Potable Water Distribution System
 - Pipelines
 - o Reservoirs
 - Pressure Reducing Stations
 - Turnout Supply Connections
 - Groundwater Treatment Facility Options



- Wastewater Collection and Treatment System
 - Gravity Mains
 - Lift Stations
 - o Force Mains
 - o Wastewater Treatment Facility Options
- Recycled Water
 - Pipelines
 - Pumps Stations
 - o Reservoirs

The potable water and wastewater costs in the CIP are divided into two phases, based on anticipated development within SLR. Phase I includes the Meadowood, Campus Park West, Campus Park, Gregory Canyon Landfill, and Warner Property projects. All other developments, including the addition of the existing Lake Rancho Viejo development are not anticipated until Phase II.

It should be noted that the potable water, wastewater, and recycled water proposed facilities all directly relate to each other, as decisions regarding alternatives for one system can affect the necessary improvements in another system. The facilities and phasing presented herein are conceptual in nature and are directly related to the level of proposed development. As development and system facilities progress, criteria, demand projections, facility phasing and associated facility improvements may change.

Following are the results of the CIP:

- As shown in Table 15, the estimated cost for the potable water portion of the CIP is \$83 million.
 - Phase I estimated costs are \$55 million.
 - Phase II estimated costs are \$29 million.
 - Ultimate estimated costs may decrease if the recycled water CIP is pursued, thereby reducing SLR's ultimate demand for potable water.



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- As shown in Table 22, the estimated costs for the wastewater portion of the CIP range from \$74 million to \$101 million.
 - Phase I estimated costs range from \$46 million to \$62 million, depending on which wastewater treatment alternative is selected.
 - Phase II estimated costs range from \$28 million to \$39 million, depending on which wastewater treatment alternative is selected.

Similarly, the recycled water portion of the CIP was also divided into two phases. However, unlike the other components of the CIP whose phasing was based on anticipated development within SLR, the recycled water phasing is based on anticipated demand for recycled water. As such, there is no relation between the recycled water phasing and the phasing utilized for potable water, wastewater and miscellaneous costs. When SLR ultimately pursues the recycled water CIP, ultimate costs of the potable water CIP could be reduced, as ultimate demand for potable water will be reduced. A summary of the proposed recycled water CIP follows:

- As shown in Table 26, total recycled water CIP estimated costs are \$33 million.
 - Phase I estimated costs are \$13 million.
 - Phase II estimated costs are \$20 million.

Unit Costs

Unit costs used to develop capital cost estimates for proposed facilities were developed using the Engineering News Record Construction Cost Index and recently completed projects by IEC of a similar nature. These estimates are based on the best available data at the time of this report; however, since prices of materials and labor fluctuate with time, new estimates should be obtained during pre-design for proposed facilities to confirm budget amounts. Recent market trends have indicated substantial volatility in the price of construction materials such as steel and concrete. These factors, coupled with the high level of similar work currently being performed, have on occasion resulted in a generally unpredictable bidding environment.

The Engineering News Record Construction Cost Index used for this report was for the 20-city national average. The ENR-CCI is an inflation index used to adjust prices from one time period to another. The cost estimates presented in this report are based upon an ENR-CCI cost index of 7,479 for August 2005. Costs estimated herein for recommended facilities should be adjusted in the future either by making new estimates or by comparing the future ENR-CCI index to 7,479.

A factor of 20 percent of total construction cost has been used for engineering and administration, which includes, but is not limited to the following:

Planning and Pre-design reports



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- Design
- CEQA compliance
- Permits
- Surveying
- Service during construction (submittals, as-builts)
- Inspection

A factor of 30 percent has been added for contingencies. These engineering, administration and contingency factors have been incorporated into all unit costs. Estimates of probable capital costs provided represent Order of Magnitude level costs as established by the American Association of Cost Engineers (AACE) and represent an accuracy of +50% to -30%.

Potable Water Unit Costs

Pipeline Unit Costs

Pipe materials, pavement saw cutting, removal and replacement, traffic control, installation of miscellaneous appurtenances, excavation, bedding and backfill were taken into consideration in developing unit costs for potable water pipeline construction. Table 7 shows the pipeline unit costs used to determine the costs of recommended pipeline improvements.

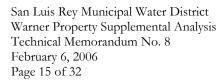
Table 7 – Pipeline Unit Costs (Potable Water)

Pipe Diameter (inches)	Pipe Unit Cost (\$/ft)
8	\$150
12	\$170
16	\$215
18	\$245
20	\$275
24	\$305
27	\$320

Note: Costs include Engineering, Legal, Administration and Contingencies

Reservoir Unit Costs

The cost estimates for reservoirs includes an allowance for limited site preparation and grading, yard piping, valving, ringwall footing, fencing, and landscaping. For the purposes of cost



development, it has been assumed that reservoirs will be constructed of steel, be aboveground, and would have a nominal water depth of 32 ft. From recent experience, IEC estimates reservoir unit costs to be \$0.90/stored gallon, with a minimum tank cost of \$375,000 for smaller tanks.

Pressure Reducing Station Unit Costs

The unit cost for pressure reducing stations includes pressure reducing valves, pressure reducing station vault, grading, miscellaneous piping and valving, fencing, landscaping, instrumentation, and controls. IEC estimates the cost of each pressure reducing station individually, based on rated capacity and pressure differential across the station. Three valves were assumed to accommodate a large range of minimum, peak and fire flow demands.

Turnout Supply Connection Unit Costs

The unit cost for flow control facilities includes vaults, grading, miscellaneous piping and valving, fencing, landscaping, instrumentation, and controls. From recent experience, IEC estimates the cost of a flow control facility to be \$1,136,000.

Groundwater Treatment Facility Unit Costs

As discussed in the Master Plan, IEC has prepared two options for SLR's groundwater treatment facilities. Each option is comprised of distinct components, which affect the estimated cost of the ultimate facility. Total cost estimates for each option are presented later in this section, with detailed cost estimates for each component.

Wastewater Unit Costs

Gravity Main Unit Costs

Pipe materials, manholes, pavement replacement, traffic control, installation of miscellaneous appurtenances, excavation, bedding and backfill were taken into consideration in developing unit costs for gravity main construction. Table 8 presents the gravity main unit costs utilized in developing the capital costs presented in this master plan effort.

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Table 8 - Gravity Main Unit Costs

Pipe Diameter (inches)	Pipe Unit Cost (\$/ft)
8	\$175
10	\$190
12	\$205
15	\$235
18	\$265
21	\$306
24	\$335

Note: Costs include Engineering, Legal, Administration and Contingencies

Lift Station Unit Costs

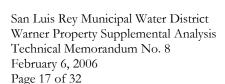
Lift station requirements are based upon the total capacity (including standby capacity) of the lift station. The requirements presented herein assume that each proposed lift station will contain three pumps of equal capacity. Two pumps will be capable of meeting the required peak wet weather flow with the third pump on standby. The construction cost for wastewater pumping stations include a typical wet well/dry well configuration with odor control for the wet well and emergency power capabilities. The pump station capacity is the "Firm Capacity" which is the maximum flow rate of the pump station with the largest pump out of service. All cost estimates for lift stations are based on upon recently designed and constructed projects of similar scope and magnitude.

Force Main Unit Costs

Force main unit costs are similar to the unit costs for potable water pipelines presented in Table 7. Costs for pipe materials, pavement replacement, traffic control, installation of miscellaneous appurtenances, excavation, bedding and backfill are included in these unit costs.

Wastewater Treatment Facility Unit Costs

As discussed in the Master Plan, IEC has prepared three options for SLR's wastewater treatment facilities. Each option is comprised of distinct components, which affect the estimated cost of the ultimate facility. Total cost estimates for each option are presented later in section, with detailed cost estimates for each component.



Recycled Water Unit Costs

Pipeline Unit Costs

Unit costs for recycled water pipelines are identical to those presented for potable water pipelines in Table 7. Pipe materials, pavement saw cutting, removal and replacement, traffic control, installation of miscellaneous appurtenances, excavation, bedding and backfill were taken into consideration in developing unit costs for water pipeline construction.

Pump Station Costs

The cost estimates for pump stations includes pumps and motors (including standby), pump station building, grading, miscellaneous piping and valving, fencing, landscaping, instrumentation, controls, engineering, administration, and contingencies. Pump Station Costs were developed by IEC based on recently designed and constructed projects of similar scope and magnitude.

Reservoir Unit Costs

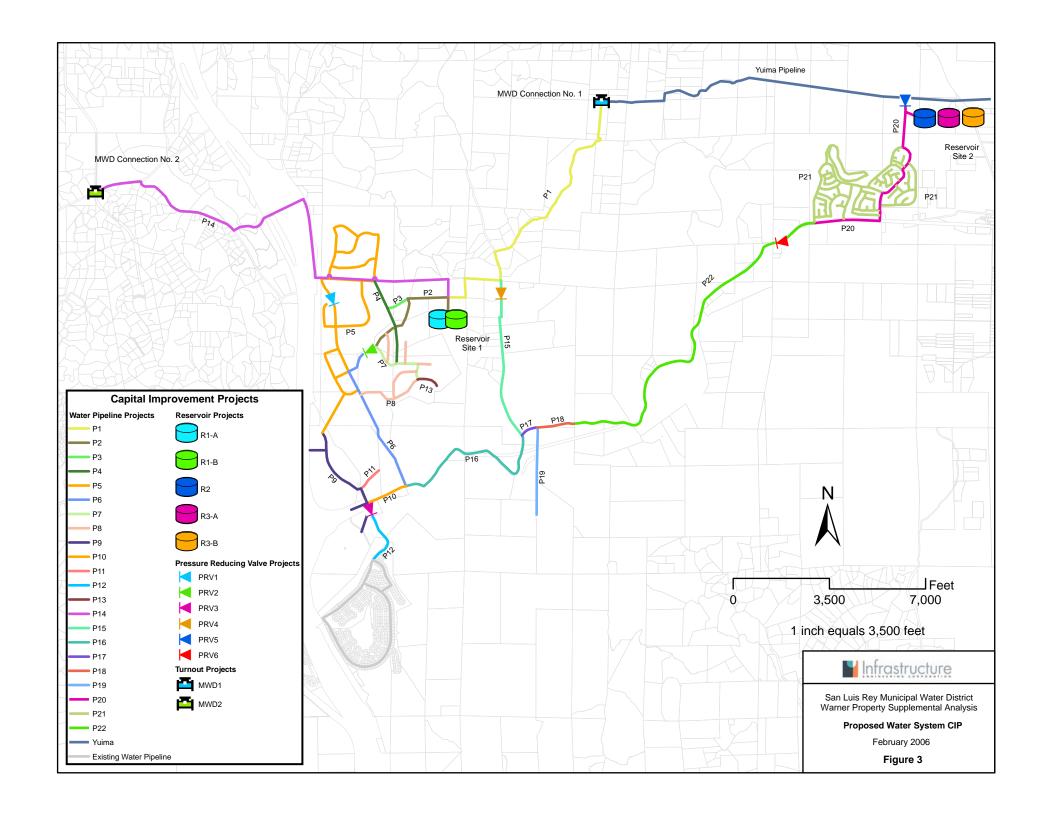
The cost estimates for reservoirs includes an allowance for limited site preparation and grading, yard piping, valving, ringwall footing, fencing, and landscaping. For the purposes of cost development, it has been assumed that reservoirs will be constructed of steel, would be aboveground, and would have a nominal water depth of 32 ft. From recent experience, IEC estimates Reservoir unit costs to be \$0.90/stored gallon, with a minimum tank cost of \$375,000 for smaller tanks.

PROPOSED WATER DISTRIBUTION SYSTEM COST ESTIMATES

Proposed potable water pipelines, reservoirs, pressure reducing stations, and turnout supply connections were assigned project numbers, and are illustrated in Figure 3. Based on the estimated time of proposed developments in SLR, each project was assigned to either Phase I or Phase II. Construction cost estimates for each project, as well as the two groundwater treatment options, previously presented in the Master Plan, are presented. Estimates of probable capital costs provided herein represent "Conceptual" level costs as established by the American Association of Cost Engineers (AACE) and represent an accuracy of +50% to -30%. Cost estimates should be verified and updated during the pre-design phase of each project. Capital cost estimates for these entities are discussed in the following sections.

Recommended Potable Water Pipelines and Cost Estimates

Table 9 presents a list of the recommended water system pipelines for the SLR study area, as presented in Figure 3. Pipeline recommendations were based upon the distribution system's ability to meet both Peak Day Demand with Fire Flow, and Peak Hour Demand operational scenarios, while satisfying the established design criteria. A total of 19.8 linear miles of pipeline are proposed in Phase I, with an additional 9.6 miles proposed in Phase II. Cost estimates for each





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project have been developed based upon the unit costs presented in Table 7, the proposed diameter and the estimated length of each project. At this time SLR's proportionate share of the Yuima Pipeline is unknown and it was assumed that their cost would be equivalent to a 20" pipeline, which is what would be required to serve only SLR.

Table 9 - Proposed Potable Water Pipeline Costs

Project Number (in) Length (it) (\$/LF) Phase I Phase II P1 27 10,380 \$320 \$3,321,600 - P2 24 4,600 \$305 \$1,403,000 - P3 18 830 \$245 \$203,350 - P4 16 1,810 \$215 \$763,150 - P5 12 470 \$170 \$3,504,900 - P6 20 3,950 \$275 \$1,586,450 - P7 8 2,460 \$150 \$963,000 - P8 8 8 6,420 \$150 \$963,000 - P8 8 8 6,420 \$150 \$993,000 - P9 12 1,080 \$170 \$9944,850 - P1 8 930 \$150 \$139,500 - P11 8 930 \$150 \$139,500 - P12 16 1,990 \$215 - \$427,850 \$120,000 \$170 \$170 \$170 \$170 \$170 \$170 \$170 \$	Table 9 - Proposed Potable Water Pipeline Costs					
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P21 8 32,280 \$150 \$4,842,000 - P22 20 13,190 \$275 - \$3,627,250 Yuima Pipeline* 20 16,450 \$275 \$4,523,750	P19	12	3,180	\$170	-	\$540,600
P22 20 13,190 \$275 - \$3,627,250 Yuima Pipeline* 20 16,450 \$275 \$4,523,750	P20	20	7,530	\$275	\$2,070,750	-
Yuima Pipeline* 20 16,450 \$275 \$4,523,750	P21	8	32,280	\$150	\$4,842,000	-
	P22	20	13,190	\$275	-	\$3,627,250
	Yuima Pipeline*	20	16,450	\$275	\$4,523,750	
, , , , , , , , , , , , , , , , , , , ,	TOTAL			.		\$13,558,900
GRAND TOTAL \$52,179,350	GRAND TOTAL				, ,	

^{*}At this time SLR's proportionate share of the Yuima Pipeline is unknown and it was assumed that their cost would be equivalent to a 20" pipeline, which is what would be required to serve only SLR.



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Recommended Reservoirs and Cost Estimates

Final storage recommendations are based upon the recommended storage criteria defined in the Master Plan. The Master Plan recommended Phase I and Phase II storage based upon the near-term and ultimate storage requirements. Each phase consisted of two reservoirs with Phase I consisting of two 6.6 MG reservoirs and Phase II consisting of two 7.7 MG reservoirs. Due to environmental constraints, both reservoir sites were located within the Meadowood planning area. With the addition of the Warner Property, the opportunity to move the Phase II storage to a site other than that containing the Phase I storage now exists. From a reliability and redundancy standpoint, this is a preferred alternative.

Initial storage alternatives examined as part of this analysis included combining the Phase I storage and dividing it amongst the two sites, however, without the ability to transfer water along Highway 76; this could create water quality issues at the Warner Property site. Therefore, it was determined that the preferred alternative is to construct the near-term storage required for the Warner Property at the Warner Property site and move the Phase II storage to the Warner Property Site. The construction of the Phase II storage would coincide with the construction of a transmission main in Highway 76 connecting Zone 4 to Zone 2, allowing storage from the Warner Property site to supplement Zone 2 and Zone 3.

Ultimate potable water storage is recommended to be 31.0 MG, with 15.8 MG required in Phase I and an additional 15.2 MG recommended for Phase II. Estimated construction costs shown in Table 10 are based on the unit costs presented previously in this chapter, and the size of each reservoir.

Table 10 - Proposed Potable Reservoir Costs

Project Number	Proposed Capacity (MG)	Estimated Cost (\$)		
Froject Number	Froposed Capacity (MG)	Phase I	Phase II	
R1-A	6.6	\$5,940,000	-	
R1-B	6.6	\$5,940,000	-	
R2	2.6	\$2,340,000	-	
R3-A	7.6	-	\$6,840,000	
R3-B	7.6	-	\$6,840,000	
TOTAL	\$13,680,000			
GRAND TOTAL	\$27,900,000			

Recommended Pressure Reducing Stations and Cost Estimates

The total flow capacity for each proposed pressure reducing station was calculated based on the greater of the two values between ultimate peak day plus fire flow and ultimate peak hour demands for areas served by each pressure reducing station. The capital cost per station was estimated to range from \$150,000 to \$225,000, based on rated capacity and pressure differential

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across the station. Each pressure reducing station was assigned a project number, as shown in Figure 3, and assigned to either Phase I or Phase II. Table 11 illustrates the estimated costs for each pressure reducing station.

Table 11 - Proposed Pressure Reducing Station Costs

Project	Proposed	Upstream	Downstream	Estimated	d Cost (\$)
Number	Capacity (gpm)	Pressure (psi)	Pressure (psi)	Phase I	Phase II
PRV1	12,300	150	125	\$225,000	ı
PRV2	3,700	150	108	\$150,000	-
PRV3	3,500	150	80	-	\$150,000
PRV4	2,500	150	85	-	\$150,000
PRV5	4,000	MWD	15	\$160,000	-
PRV6	4,000	150	125	-	\$160,000
TOTAL				\$535,000	\$460,000
GRAND TOTAL					\$995,000

Recommended Turnout Supply Connections and Cost Estimates

Two turnout supply connections were recommended in the Master Plan, as illustrated in Figure 3. Each of these has been assigned a project number, with MWD1 attributed to Phase I and MWD2 assigned to Phase II. Estimated construction costs are based on IEC's experience with projects of similar size and scope.

Table 12 - Proposed Turnout Supply Connection Costs

Project Number	Proposed Capacity (MGD)	Estimated Cost (\$)		
r roject Number	Proposed Capacity (MGD)	Phase I	Phase II	
MWD1	13.1	\$1,136,000	-	
MWD2	13.1	-	\$1,136,000	
TOTAL		\$1,136,000	\$1,136,000	
GRAND TOTAL	\$2,272,000			

Recommended Groundwater Treatment Facility Options and Cost Estimates

As previously presented in the Master Plan, IEC has prepared two options for SLR's groundwater treatment facilities. Construction cost estimates for each option are presented in Tables 13 and 14. Option One, presented in Table 13, consists of five extraction wells and a 2.0 MGD Desalter. Option Two, presented in Table 14, consists of eight extraction wells and a 4.0 MGD Desalter. Currently all associated costs with the groundwater treatment options are allocated to Phase II, however as the planning for these facilities progresses, it may be possible to distribute these costs between Phases I and II based on the expansion schedule of the selected option.



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Table 13 - Option One – 2.0 MGD Desalter

Facility Name	Length (ft)	Diameter (in)	Facility Capacity	Estimated Cost (\$)
Raw Water Collection Lines	3,000	12	-	\$616,500
Raw Water Line 2	3,000	16	-	\$765,000
Extraction Well 1	-	-	1.08 MGD / 1210 AF-YR	\$750,000
Extraction Well 2	-	-	1.08 MGD / 1210 AF-YR	\$750,000
Extraction Well 3	-	-	1.08 MGD / 1210 AF-YR	\$750,000
Extraction Well 4	-	-	1.08 MGD / 1210 AF-YR	\$750,000
Extraction Well 5	-	-	1.08 MGD / 1210 AF-YR	\$750,000
Brine Line	73,000	8		\$13,140,000
Brine Pump Station	-	-	260 GPM	\$750,000
R.O. Desalter	-	-	2.0 MGD / 2800 AF-YR	\$19,500,000
TOTAL			2.0 MGD	\$38,521,500

Note on Extraction Wells. 3 wells are to be operating at any given time with 2 on standby for a peak operating capacity of 3.24 MGD or 3630 acre-ft/year. An assumed operating capacity for the aquifer is 2.14 MGD or 2400 acre-ft/year.



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Table 14 - Option Two - 4.0 MGD Desalter

Facility Name	Length (ft)	Diameter (in)	Facility Capacity	Estimated Cost (\$)
Raw Water Line 1	3,000	12	-	\$616,500
Raw Water Line 2	3,000	16	-	\$765,000
Extraction Well 1	-	-	1.08 MGD / 1210 AF-YR	\$750,000
Extraction Well 2	-	-	1.08 MGD / 1210 AF-YR	\$750,000
Extraction Well 3	-	-	1.08 MGD / 1210 AF-YR	\$750,000
Extraction Well 4	-	-	1.08 MGD / 1210 AF-YR	\$750,000
Extraction Well 5	-	-	1.08 MGD / 1210 AF-YR	\$750,000
Extraction Well 6	-	-	1.08 MGD / 1210 AF-YR	\$750,000
Extraction Well 7	-	-	1.08 MGD / 1210 AF-YR	\$750,000
Extraction Well 8	-	-	1.08 MGD / 1210 AF-YR	\$750,000
Brine Line	73,000	8		\$13,140,000
Brine Pump Station	-	-	417 GPM	\$750,000
R.O. Desalter	-	-	4.0 MGD / 4481 AF-YR	\$30,000,000
TOTAL		4.0 MGD / 4481 AF-YR	\$51,271,500	

^{*}Maximum Capacity Shown. 4 wells are to be operating at any given time with 4 on standby for a peak operating capacity of 4.32 MGD or 4340 acre-ft/year. An assumed operating capacity for the aquifer is 4.0 MGD or 4481 acre-ft/year.

Summary of Proposed Potable Water Capital Improvements

Table 15 shows a summary of proposed potable water capital costs broken down by facility type and phase. The total cost of SLR's ultimate potable water system is \$83.3 million.

Table 15 - Summary of Potable Water Capital Improvement Costs

Facility	Estimated Cost (\$)		
racility	Phase I	Phase II	
Pipelines	\$38,620,450	\$13,558,900	
Reservoirs	\$14,220,000	\$13,680,000	
Pressure Reducing Stations	\$535,000	\$460,000	
Turnout Supply Connections	\$1,136,000	\$1,136,000	
TOTAL	\$54,511,450	\$28,834,900	
GRAND TOTAL	\$83,346,350		



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PROPOSED WASTEWATER COLLECTION AND TREATMENT COST ESTIMATES

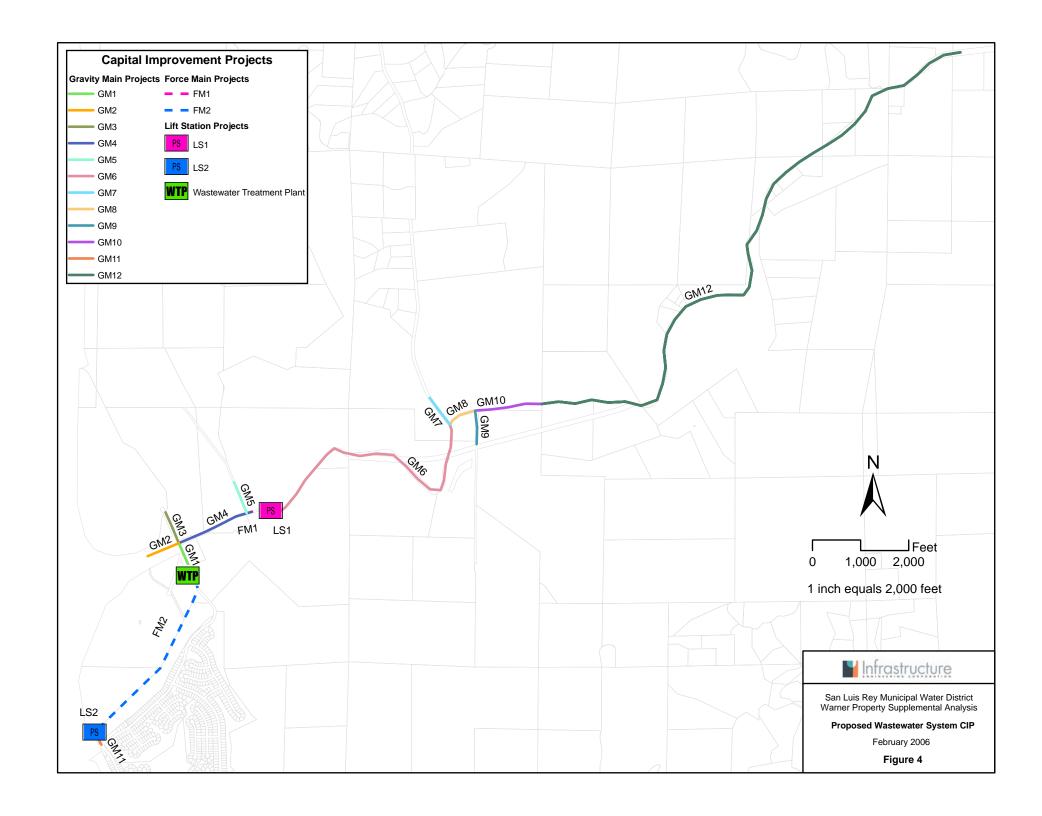
Proposed gravity mains, lift stations and force mains were assigned project numbers, and are illustrated in Figure 4. Based on the estimated time of proposed developments in SLR, each project was assigned to either Phase I or Phase II. Construction cost estimates for each project, as well as the three wastewater treatment facility options are presented. Estimates of probable capital costs provided herein represent "Conceptual" level costs as established by the American Association of Cost Engineers (AACE) and represent an accuracy of +50% to -30%. Cost estimates should be verified and updated during the pre-design phase of each project. Capital cost estimates for these entities are discussed in the following sections.

Recommended Gravity Mains and Cost Estimates

Table 16 presents a list of the recommended gravity mains for the SLR service area, as illustrated in Figure 4. Gravity main recommendations were based upon the collection system's ability to convey the ultimate (build-out) condition projected peak wet weather flow, while satisfying the established design criteria. A total of 5.5 miles of linear gravity mains are proposed in Phase I, with an additional 0.3 miles proposed in Phase II. Cost estimates for each project have been developed based upon the unit costs presented in Table 8, the proposed diameter and the estimated length of each project.

Table 16 - Proposed Gravity Main Costs

Table 10 - Proposed Gravity Main Costs						
Droigot Number	Dina Diameter (in)	Longth (ft)	Linit Coot (\$/LE)	Estimated	d Cost (\$)	
Project Number	Pipe Diameter (in)	Length (ft)	Unit Cost (\$/LF)	Phase I	Phase II	
GM1	24	790	\$335	\$264,650	-	
GM2	15	700	\$235	\$164,500	-	
GM3	15	700	\$235	\$164,500	-	
GM4	15	110	\$235	\$436,600		
GIVI4	18	1,550	\$265	φ430,000	-	
GM5	12	700	\$205	\$143,500	-	
GM6	15	830	\$235	\$1,520,050	-	
GIVIO	18	5,000	\$265			
GM7	12	350	\$205		¢454,000	
GIVI7	15	350	\$235] -	\$154,000	
GM8	15	620	\$235	\$145,700	-	
GM9	12	350	\$205		\$154,000	
Givis	15	350	\$235	-	φ154,000	
GM10	8	1,400	\$175	\$245,000	-	
GM11	15	180	\$235	-	\$42,300	
GM12	15	16,450	\$235	\$3,865,750		
TOTAL				\$6,950,250	\$350,300	
GRAND TOTAL					\$7,300,550	



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Recommended Lift Stations and Cost Estimates

Two lift station are proposed as components of SLR's ultimate (build-out) wastewater collection system. As illustrated in Figure 4, each of these lift station was assigned a project number. Table 17 presents the proposed lift stations, which are sized to handle ultimate peak wet weather flows.

Table 17 - Proposed Wastewater Lift Station Costs

	1			
Project Number	Rated Capacity (MGD)	Estimated Cost (\$)		
Project Number	Rated Capacity (MGD)	Phase I	Phase II	
LS1	1.8	\$2,700,000	-	
LS2	0.5	-	\$750,000	
TOTAL		\$2,700,000	\$750,000	
GRAND TOTAL	\$3,450,000			

Recommended Force Mains and Cost Estimates

Table 18 presents a list of the recommended force mains for the SLR service area, as presented in Figure 4. Force main recommendations were based upon the projected peak wet weather flow tributary to each associated lift station, while satisfying the established design criteria. A total of 0.1 linear miles of force mains will be required in Phase I and approximately 0.8 linear miles of force mains will be required in Phase II. Cost estimates for each force main project have been developed based upon the unit costs presented in Table 7, the proposed diameter and the estimated length of each project.

Table 18 - Proposed Force Main Costs

		1			
Project Number	Pipe Diameter (in)	Length (ft)	Length (ft) Unit Cost (\$/LF)		ed Cost (\$)
Froject Number	Fipe Diameter (iii)	Lengin (ii)	Offit Cost (\$/LF)	Phase I	Phase II
FM1	12	350	\$170	\$59,500	-
FM2	8	4,000	\$150	-	\$600,000
TOTAL		•		\$59,500	\$600,000
GRAND TOTAL					\$659,500

Recommended Wastewater Treatment Facility Options and Cost Estimates

IEC has prepared three options for SLR's ultimate wastewater treatment facilities. Construction cost estimates for each option are presented in Tables 19 through 21. Option One, presented in Table 19, consists of a 2.4 MGD Wastewater Treatment Plant which satisfies SLR's ultimate (build-out) wastewater flow projections. Option Two, presented in Table 20, consists of conveying the ultimate wastewater flow to Oceanside's SLR Wastewater Treatment Plant. Option Three, presented in Table 21, consists of constructing a regional 3.9 MGD treatment plant.

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Table 19 - Wastewater Treatment Option One - 2.4 MGD WWTP

Facility Name	Length (ft)	Diameter (in)	Facility Capacity	Estimated Cost (\$)
Recycled Water Treatment Plant	-	-	2.4 MGD	\$33,432,000
Wet Weather Storage Reservoir	-	-	202 MG / 621 AF ¹	\$29,270,000
TOTAL			2.4 MGD	\$62,702,000

¹Worst case was assumed. Disposal of recycled water through percolation ponds could substantially reduce the required wet weather storage volume

Table 20 - Wastewater Treatment Option Two - Convey to Oceanside's SLR WWTP

Facility Name	Length (ft)	Diameter (in)	Facility Capacity	Estimated Cost (\$) ¹
Trunk Sewer	73,000	24	-	\$26,499,000
Lift Station 1	-	1	4.2 MGD	\$3,000,000
Lift Station 2	-	-	4.2 MGD	\$3,000,000
	TOTAL		4.2 MGD	\$32,499,000

¹Cost does not include the negotiation or purchase of actual capacity in the Oceanside WWTP, the land outfall, or the ocean outfall.

Table 21 - Wastewater Treatment Option Three - 3.9 MGD WWTP

Facility Name	Length (ft)	Diameter (in)	Facility Capacity	Estimated Cost (\$)
Recycled Water Treatment Plant	-	-	3.9 MGD	\$40,500,000
Wet Weather Storage Reservoir	-	-	327 MG / 1009 AF ¹	\$40,679,000
Lift Station			1.5 MGD	\$1,500,000
Force Main	38,000	12		\$6,460,000
TOTAL			3.9 MGD	\$89,139,000

¹Worst case was assumed. Disposal of recycled water through percolation ponds could substantially reduce the required wet weather storage volume

Summary of Proposed Wastewater Capital Improvements

Table 22 presents a summary of proposed wastewater capital costs broken down by facility type and phase. As SLR is yet to select a specific wastewater treatment option, totals are included for both options outlined in the Master Plan. The total cost of SLR's ultimate wastewater system ranges from \$74 million to \$101 million, depending of which wastewater treatment option is selected.

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Table 22 - Summary of Wastewater Capital Improvement Costs

Facility	Estimated	Cost (\$)	
racility	Phase I	Phase II	
Gravity Mains	\$6,950,250	\$350,300	
Lift Stations	\$2,700,000	\$750,000	
Force Mains	\$59,500	\$600,000	
Subtotal	\$9,709,750	\$1,700,300	
Wastewater Treatment Option One - 2.4 MGD WWTP	\$36,576,167	\$26,125,833	
Wastewater Treatment Option Two - Convey to Oceanside	\$18,957,750 ¹	\$13,541,250 ¹	
Wastewater Treatment Option Three - 3.9 MGD WWTP	\$51,997,750	\$37,141,250	
Total with WWT Option One (2.4 MGD WWTP)	\$46,285,917	\$27,826,133	
Total with WWT Option Two (Convey to Oceanside)	\$28,667,500 ¹	\$15,241,550 ¹	
Total with WWT Option Three (3.9 MGD WWTP)	\$61,707,500	\$38,841,550	
GRAND TOTAL with WWT OPTION ONE (2.4 MGD WWTP)	\$74,112,050		
GRAND TOTAL with WWT OPTION TWO (CONVEY TO OC	\$43,909,050 ¹		
GRAND TOTAL with WWT OPTION THREE (3.9 MGD WWT	TP)	\$100,549,050	

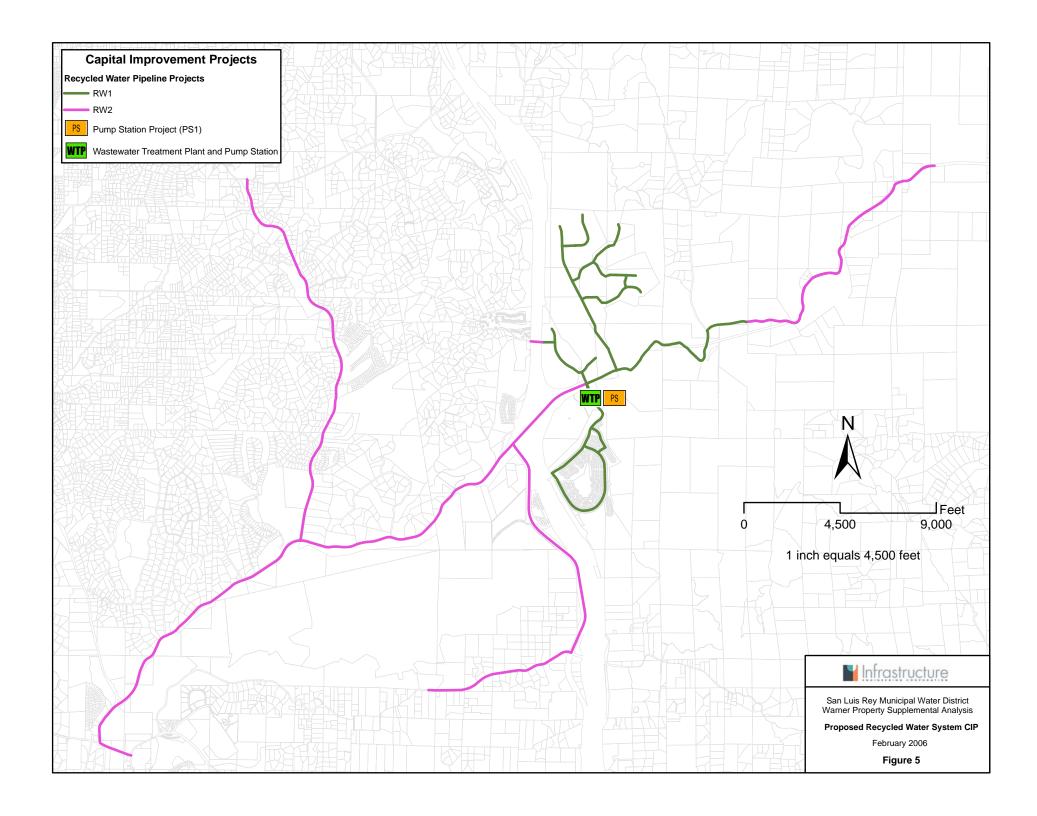
¹Costs to convey wastewater to Oceanside do not include the negotiation or purchase of actual capacity in the Oceanside WWTP, the land outfall, or the ocean outfall. It is assumed that the Option Two costs will exceed the Option One costs.

PROPOSED RECYCLED WATER DISTRIBUTION SYSTEM COST ESTIMATES

Proposed recycled water pipeline and pump stations were assigned project numbers, and are illustrated in Figure 5. Storage reservoirs are not shown, as their final location is yet to be determined. Construction cost estimates for each project are presented, and assigned to either Phase I or Phase II of anticipated development. Unlike potable water and wastewater phasing, which was based on the estimated time of proposed developments in SLR, recycled water phasing is based upon anticipated recycled water demand. Estimates of probable capital costs provided herein represent "Conceptual" level costs as established by the American Association of Cost Engineers (AACE) and represent an accuracy of +50% to -30%. Cost estimates should be verified and updated during the pre-design phase of each project. Capital cost estimates for these entities are discussed in the following sections.

Recommended Pipelines and Cost Estimates

Table 23 presents a list of the recommended recycled water system pipelines for SLR, as illustrated in Figure 5. Pipeline recommendations were based upon the distribution system's ability to meet both peak recycled water demands, while satisfying the established design criteria. A total of 9.4 linear miles of pipeline are proposed in Phase I, with an additional 15.8 linear miles proposed in Phase II. Cost estimates for each project have been developed based upon the unit costs presented in Table 7, the proposed diameter and the estimated length of each project.



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Table 23 - Proposed Recycled Water Pipeline Costs

Project Number	Pipe Diameter (in)	Length (ft)	Unit Cost (\$/LF)	Estimated Cost (\$)	
				Phase I	Phase II
RW1	8	43,670	\$150		-
	12	5,300	\$170	\$7,561,150	
	16	510	\$215		
RW2	8	66,740	\$150		\$12,838,100
	12	16,630	\$170	_	
TOTAL				\$7,561,150	\$12,838,100
GRAND TOTAL					\$20,399,250

Recommended Pump Stations and Cost Estimates

Table 24 presents the estimated construction cost associated with the recycled water pump station, illustrated in Figure 5. An initial 3,000 gpm is recommended to satisfy the recycled water demands in Phase I, with a 7,300 gpm expansion proposed for Phase II. The ultimate rated capacity of the pump station is 10,300 gpm.

Table 24 - Proposed Recycled Water Pump Station Costs

Project Number	Total Rated	Estimated Cost (\$)		
Froject Number	Capacity (gpm)	Phase I	Phase II	
Recycled Water Pump Station (PS1)	3,000	\$3,750,000	-	
Recycled Water Pump Station Expansion (PS1)	7,300	-	\$2,375,000	
TOTAL	10,300	\$3,750,000	\$2,375,000	
GRAND TOTAL	\$6,125,000			

Recommended Reservoirs and Cost Estimates

Final recycled water storage recommendations are based upon the projected demands presented in Recycled Water System Analysis Section. While Phase I storage is proposed to be 2.1 MG, and Phase II an additional 5.2 MG, the exact locations of these reservoirs is yet to be determined by SLR. Estimated construction costs shown in Table 25 are based on the unit costs presented previously in this chapter, and the size of each reservoir.

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Table 25 - Proposed Recycled Water Reservoir Costs

	Proposed	Estimated Cost (\$)		
Project Number	Capacity (MG)	Phase I	Phase II	
Recycled Reservoir 1	2.1	\$1,890,000	-	
Recycled Reservoir 2	5.2	- \$4,680,00		
TOTAL \$1,8			\$4,680,000	
GRAND TOTAL	\$6,570,000			

Summary of Proposed Recycled Water Capital Improvements

Table 26 presents a summary of the proposed recycled water capital costs broken down by facility type and phase. The total cost of SLR's ultimate recycled water system is estimated to be \$33 million.

Table 26 - Summary of Recycled Water Capital Improvement Costs

	3 1	±	
Facility	Estimated Cost (\$)		
Facility	Phase I	Phase II	
Pipelines	\$7,561,150	\$12,838,100	
Pump Stations	\$3,750,000	\$2,375,000	
Reservoirs	\$1,890,000	\$4,680,000	
Subtotal	\$13,201,150	\$19,893,100	
GRAND TOTAL	\$33,094,250		

SUMMARY OF CAPITAL IMPROVEMENT PROGRAM

The potable water and wastewater costs in the CIP are divided into two phases, based on anticipated development within SLR. Phase I includes the Meadowood, Campus Park West, Campus Park, Gregory Canyon Landfill, and Warner Property Developments. All other developments are not anticipated until Phase II, with the following results:

- As shown in Table 15, the estimated cost for the potable water portion of the CIP is \$83 million.
 - Phase I estimated costs are \$55 million.
 - Phase II estimated costs are \$29 million.
 - Ultimate estimated costs may decrease if the recycled water CIP is pursued, thereby reducing SLR's ultimate demand for potable water.
- As shown in Table 22, the estimated costs for the wastewater portion of the CIP range from \$74 million to \$101 million.

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- Phase I estimated costs range from \$46 million to \$62 million, depending on which wastewater treatment alternative is selected.
- Phase II estimated costs range from \$28 million to \$39 million, depending on which wastewater treatment alternative is selected.

Similarly, the recycled water portion of the CIP was also divided into two phases. However, unlike the other components of the CIP whose phasing was based on anticipated development within SLR, the recycled water phasing is based on anticipated demand for recycled water. As such, there is no relation between the recycled water phasing and the phasing utilized for potable water, wastewater and miscellaneous costs. If SLR ultimately pursues the recycled water CIP, ultimate costs of the potable water will be reduced, as ultimate demand for potable water will be reduced. A summary of the proposed recycled water CIP follows:

- As shown in Table 26, total recycled water CIP estimated costs are \$31 million.
 - Phase I estimated costs are \$13 million.
 - Phase II estimated costs are \$20 million.